WHAT IS CLAIMED IS:

1. A process for the processing of fruits of the type comprising oil-producing drupes with an epicarp or skin, a mesocarp or pulp and an endocarp or stone, said fruits being particularly olives, oil-producing palm fruits or avocados, said process comprising:

a) a heating or preheating treatment of the whole drupes under controlled conditions for carrying out a controlled heating or preheating limited to the water contained in the drupe pulp, and preferably under conditions which substantially avoid the oxidation mainly of the drupe pulp's natural antioxidants in particular;

b) a treatment effecting the rapid or virtually instantaneous evaporation of a fraction of the preheated water contained in the drupe pulp, favoring cellular destructuring limited to the pulp with incipient detachment of the pulp from the skins and stones, under conditions which substantially avoid the oxidation mainly of the pulp's natural antioxidants in particular;

c) the physical separation and recovery on the one hand of the pulp resulting from the cellular destructuring due to the above-mentioned partial evaporation of the water, essentially devoid of stones and skins, and on the other hand of the stones essentially devoid of pulp, advantageously with the skins, preferably under conditions which substantially avoid oxidation;

d) either the recovery of the destructured pulp containing the oil, essentially devoid of stones and skins, for use as such, or, preferably, the separation, preferably under conditions which substantially avoid oxidation, on the one hand of the pulp oil and on the other hand of the destructured pulp in the form of partially de-oiled purée; and

e) preferably, the recovery of the pulp oil separated off in this way, essentially devoid of oil derived from the stones and skins and containing the pulp's natural antioxidants, thereby improving the oxidation resistance of said oil.

2. The process according to claim 1 wherein the above-mentioned heating or preheating treatment is carried out in a heating enclosure protected from oxidation, in a predetermined temperature range and for a predetermined period of time which entail substantially no risk of degradation of the pulp, this heating or

preheating step being effected by means of any direct or indirect heating system and preferably by microwave emission.

3. The process according to claim 1 or 2 wherein the controlled preheating or heating of the drupes, limited to the water contained in the drupe pulp, is effected by microwave emission so that the temperature reached by the water contained in the pulp is sufficient to favor the rapid or virtually instantaneous evaporation of a fraction of said water in the above-mentioned evaporation step b), the heating or preheating preferably being effected in the heating or preheating enclosure so that the temperature reached by the water contained in the mesocarp is in the order of 80°C to 90°C.

4. The process according to one of claims 1 to 3 wherein the heated or preheated whole drupes are transferred, preferably immediately, into an evaporation enclosure maintained at a pressure below atmospheric pressure, preferably at a pressure below about 100 hectopascals and particularly preferably at between 50 and 100 HPa, in which the above-mentioned evaporation of at least part of the water contained in the pulp produces the above-mentioned cellular destructuring with incipient formation of a purée containing the oil, with cooling, and the remaining water and cellular tissues resulting from the burst or disaggregated pulp, together with the whole stones and the skins.

5. The process according to one of claims 1 to 4 wherein the destructured pulp or purée, on the one hand, and the whole stones and the skins, on the other, are separated in a separator or refiner advantageously comprising a rotary screen, preferably protected from the air and especially under a partial vacuum or an inert atmosphere, said separator or refiner completing, advantageously by means of agitation or mechanical friction, the physical refining of the cellular tissues of the pulp and the release and coalescence of the oily formations contained in the destructured pulp, and advantageously completing the physical separation of the destructured tissues of the pulp remaining on the stones.

6. The process according to one of claims 1 to 5 wherein the whole pulp in the form of purée resulting from its cellular destructuring, separated from the stones and skins, is subjected to a separation of the solid phase, the aqueous phase, if still present, and the oily phase by means of any known system, such as pressure, decantation or centrifugation, to give a drupe pulp oil which is essentially pure and essentially devoid of stone oil, kernel oil and skin oil, and which is also substantially devoid of the flavors and tastes peculiar to them, this

complementary separation advantageously being carried out after the whole pulp purée has passed through a heat exchanger, which controls the temperature of the purée and/or effects a complementary controlled dehydration to substantially completely remove the remaining aqueous phase by evaporation.

7. The process according to one of claims 1 to 6 wherein the stones, on the one hand, and the skins, on the other, are separated from the drupes by any physical means of separation, and particularly by means of any appropriate device such as a process involving meshes of appropriate size, and/or by processes involving vibration and/or ventilation, especially with air, this separation preferably taking place after the stones and skins have been dried.

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8. The process according to claim 7 wherein the stones separated from the skins are then mechanically ground so as to separate the woody shells of the stones from the kernels contained in the stones, which remain whole with their protective epidermis, the kernels advantageously being processed by means of any extraction system used to extract the oils from seeds or kernels, particularly under pressure, to give on the one hand a drupe kernel oil of high cosmetic and pharmaceutical value, and on the other hand a press cake of high nutritional value formed by the at least partially de-oiled tissues of the kernel, which are recovered, it being possible for said cake to be processed further to give an extract and a bitter active principle for medicinal use, which is called oleuropein in the case of olive processing.

9. The process according to any one of claims 2 to 8 wherein the most volatile compounds of the natural odor of the oil-producing drupes, which volatilize in the evaporation enclosure maintained under low pressure, are recovered, especially by being condensed and concentrated continuously at the outlet of the evaporation enclosure, it advantageously being possible for at least part of these most volatile compounds, recovered, condensed and concentrated in this way, optionally to be reintroduced into the finished product, according to different consumers' tastes.

10. The process according to any one of claims 1 to 9 wherein the oil-producing drupes processed are selected from the group consisting of olives, oil-palm drupes and avocados.

11. An apparatus for the processing of whole oil-producing drupes with skins, pulp and stones containing kernels, for example olives, oil-palm drupes and avocados, said apparatus comprising:

a) at least one device (20) for preheating or heating the whole drupes (1), which effects a heating or preheating limited to the water contained in the pulp and preferably comprises means of heating with the aid of microwave emitters, preferably under conditions which substantially avoid the oxidation mainly of the pulp's natural antioxidants in particular;

b) at least one sealed enclosure for rapid or virtually instantaneous evaporation of at least part of the water contained in the whole drupe pulp, under conditions which substantially avoid the oxidation mainly of the pulp's natural antioxidants in particular, said rapid or virtually instantaneous evaporation effecting a physical destructuring of the cellular tissues of the pulp with detachment or incipient detachment of these destructured cellular tissues from the skins and stones;

c) at least one device (42-52) for the physical separation and recovery on the one hand (at 58-100) of the pulp essentially devoid of stones and advantageously skins, and on the other hand (at 92-94-96) of the stones essentially devoid of pulp, advantageously with the skins, preferably under conditions which substantially avoid oxidation, this device for physical separation preferably being located in said sealed enclosure;

d) at least one device (160, 170, 172, 174) for the separation and recovery of the pulp oil essentially devoid of stone oil and containing the drupe pulp's natural antioxidants, and advantageously of a substantially de-oiled pulp paste;

e) advantageously at least one device for separating the skins from the stones, optionally after drying, advantageously with at least one device for mechanically grinding or crushing the woody shells of the stones under conditions which preserve the integrity of the kernels contained in the stones, these kernels remaining whole in their epidermis, and at least one device for mechanically separating the woody shells of the stones from the kernels; and

f) advantageously at least one device for extracting the oil contained in said separated kernels, for example a pressing device, with recovery on the one hand of the kernel oil and on the other hand of a press cake, which can preferably be subjected to a device for extraction of a bitter active principle, the latter being called oleuropein in the case of olive processing.

12. The apparatus according to claim 11 wherein the device (20) for preheating or heating the whole drupes (1) comprises means of heating with the aid of microwave emitters, which are intended to heat the water contained at least

in the drupe pulp to a temperature of between 80 and 90°C, the above-mentioned sealed enclosure. or each of the above-mentioned devices preferably being as defined in any one of claims 2 to 10.

13. A drupe pulp oil of improved purity, particularly an olive pulp oil, which is essentially devoid of stone oil contained in the kernel, and which contains the natural antioxidants present in olive oil, especially by being prepared with protection from oxidation, particularly from atmospheric oxygen, this olive pulp oil being obtainable by the process as defined in any one of claims 1 to 10 or using the olive processing apparatus as defined in claim 11 or 12

14. The drupe pulp oil according to claim 13, particularly olive pulp oil, which also contains at least part of the most volatile compounds of the natural odor of the fruit, or flavors, especially by having been reintroduced into the final oil, this pulp oil preferably containing the majority of the natural polyphenols and the tocopherol present in the whole fresh fruit, the pure olive pulp oil advantageously having an acidity, expressed as oleic acid, of less than 1% after storage for 2 years at ambient temperature, and preferably an acidity, expressed as oleic acid, of less than 0.7 g/100 g of olive oil after storage for 2 years at ambient temperature.

15. A drupe kernel oil, particularly olive kernel oil, obtainable by carrying out the process according to any one of claims 1 to 10 or using the apparatus according to claim 11 and advantageously flavored with at least part of the recovered natural flavors of the pulp.

16. A drupe pulp paste, particularly olive pulp paste, obtainable by the process according to any one of claims 1 to 10 or using the apparatus according to claim 11 or 12, and advantageously flavored with at least part of the recovered natural flavors of the pulp.

17. Volatile aromatic compounds or flavors recovered from drupes, particularly olives, oil-palm drupes or avocado drupes, obtainable by the process according to one of claims 1 to 10 or using the apparatus according to claim 11 or 12.

18. The use of the drupe pulp oil and particularly the olive pulp oil as defined in claim 12 or 13 or the drupe kernel oil and particularly the olive kernel oil according to claim 14, as a foodstuff or a cosmetic or pharmaceutical product.

19. The use of the drupe pulp paste and particularly the olive pulp paste as defined in claim 15, fresh, partially dried or dehydrated and substantially de-oiled or containing all its oil, as a foodstuff, especially for human or animal nutrition,

after removal of the bitterness.

20. The use of the woody shells of the stones as a fuel or for the manufacture of an abrasive or a filler, advantageously after mechanical micronization, these woody shells preferably being such as obtained by the process according to one of claims 1 to 10 or using the processing apparatus according to claim 11. or 12.

21. The use of the kernel press cake as a food source and active principle as obtained according to one of claims 1 to 10 or using the processing apparatus according to claim 11. or 12.